

# Condensed Matter Physics

## AC SUSCEPTIBILITY OF $\text{GdAl}_2$

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AC susceptibility measurements were performed on mechanically milled  $\text{GdAl}_2$  in an effort to characterize the magnetic transition that results from the disorder produced in the crystal structure by the milling. Our measurements did not indicate a shift in the temperature at which the peak values of the real part of susceptibility  $\chi'$  occur as the measuring frequency was varied. Pure spin glass behavior results in a shift of this peak. However, the occurrence of a peak at low temperatures, which is absent in the unmilled sample, does suggest the appearance of a magnetically glassy phase. It is possible that the milling has induced a spin-glass-like phase which coexists with a ferromagnetic phase. This coexistence of two phases may cause a suppression in the peak shift with frequency. Accurate analysis of the magnetic transition will require a finer temperature resolution for  $\chi'$  in the temperature range of the peak values. Measurements of the imaginary part  $\chi''$  were not properly ordered. The uncertainty in the  $\chi''$  data is believed to be due to the fact that the sample is metallic and eddy currents (especially at higher frequencies) will affect the  $\chi''$  values. Further work is planned to make measurements using a SQUID magnetometer with ac capabilities.